Medicare Geographic Practice Cost Index

Report to Congress
1995

U.S. Department of Health and Human Services
Health Care Financing Administration
Office of Research and Demonstrations

THE SECRETARY OF HEALTH AND HUMAN SERVICES
WASHINGTON, D.C. 20201

OCT 31 1995

The Honorable Albert Gore, Jr.
President of the Senate
Washington, D.C. 20510

Dear Mr. President:

I am respectfully submitting the report required by section 122(c) of the Social Security Act Amendments of 1994, P.L. 103-432, which directs me to study and submit to Congress a report on data necessary to review and revise the Medicare Geographic Practice Cost Index (GPCI).

This letter report describes the following items which are required by section 122(c):

1. Data necessary to review and revise the indexes (GPCIs), including

   (A) the shares allocated to physician work effort, practice expenses (other than malpractice expenses), and malpractice expenses;

   (B) the weights assigned to the input components of such shares; and

   (C) the index values assigned to such components;

2. Limitations on the availability of data necessary to review and revise such indexes at least every 3 years;

3. Ways of addressing such limitations, with particular attention to the development of alternative data sources for input components for which current index values are based on data collected less frequently than every 3 years; and

4. Costs of developing more accurate data.

BACKGROUND

A major part of the Medicare physician payment reform implemented on January 1, 1992, is a set of price indexes, termed the GPCIs, used to adjust the national Medicare Fee Schedule (MFS) amounts paid to physicians. The GPCIs, which reflect the justifiable geographic differences in physicians' costs of doing business, are reviewed not less often than every 3 years and are adjusted as needed.

For the GPCIs implemented on January 1, 1992, the Health Care Financing Administration (HCFA) used -- the 1980 Census earnings and occupation data, 1985 and 1986 malpractice premium data, 1987 Housing and Urban Development (HUD) fair market rent (FMR) data, and 1987 American Medical Association (AMA) expense share data -- which were the most recent data available at that time.

The General Accounting Office (GAO) reviewed the original GPCIs (GAO/HRD-93-93) and found that these adjusters were appropriate and that HCFA actively sought and tested numerous data sources when it developed the indexes. GAO also determined that reasonable data and methodology choices had been made, considering time constraints for implementation, but suggested that the GPCIs could be improved with newer data.

In the first review of the GPCIs, HCFA used newer data -- 1989 AMA expense share data, 1990 decennial Census earnings and occupation data, 1990 through 1992 malpractice premium data, 1992 Medicare national relative value data, and 1994 HUD data. These were the latest data available to perform the required 3-year review and implement the subsequent revision. The revised transitional GPCI values were effective January 1, 1995, and the final values will become effective January 1, 1996.

HIGHLIGHTS

HCFA awarded a competitive contract in April 1992 to study and review the GPCI methodology and data. On the basis of this review, several methodological changes were incorporated into the first revision but no better data sources were identified. We also studied the stability of the data. Study findings relevant for this report to Congress are summarized below:

1. Data needed:

   To revise the work, practice expense and malpractice GPCI and to weight the components of the indexes, HCFA requires practice expense data to calculate shares, relative value unit (RVU) data to calculate weights, and occupationally adjusted income data for professionals and health care workers, as well as, rent data, and malpractice data to calculate index values.

2. Limitations on data available to review and revise such indexes at least every 3 years:

   The three major limitations on data availability are (1) the geographic detail needed for the GPCIs, (2) the geographic coverage of data, i.e., its breadth, and (3) the frequency with which sources update the data used for calculating the GPCIs. Because the indexes relate one geographic area to another, reliable data must be found that are routinely updated and available at a detailed enough geographic level to include all Medicare Fee Schedule Areas (MFSAs).

a. Income/occupational data limitations (Work): Comprehensive professional earnings are routinely available from the Bureau of the Census only every 10 years.

b. Practice expense data limitations: (Rent) -- Even though HUD publishes updated FMRs annually, rents for large metropolitan areas are actually resurveyed only on a 4-year cycle, and all rents are recalibrated only once every 10 years using the Decennial Census. (Employee wage component) -- As for the work GPCI, comprehensive employee occupational income data are available only every 10 years.

c. Malpractice premium data limitations: (Malpractice) Although HCFA surveys malpractice insurance companies annually, malpractice premiums are very volatile; thus, a 3-year average of premium data is used to calculate the GPCI. We conclude that revising any of the indexes more frequently than is necessary to maintain an accurate index is undesirable, especially the malpractice component. Enough time should elapse between revisions so that changes in the malpractice GPCI or in the practice expense components reflect actual changes in practice costs rather than random variation.

3. Ways of addressing data limitations and alternative sources:

Since HUD data, AMA share data, malpractice premium data, and Medicare RVU weight data are updated frequently enough to allow HCFA to review those components at least every 3 years, we concentrated our efforts on ways to update the Census decennial wage data. Our contractor examined the suitability of a number of data sources that are candidates for updating the census wage indexes between censuses, i.e., the Bureau of Economic Analysis' (BEAs) ES-202 data, the Bureau of Labor Statistics (BLS) Current Population Survey, the BLS Manufacturing Wage, the Internal Revenue Service's Statistics of Income tax return data, BLS Employment Cost Index, the HCFA prospective payment system (PPS) hospital wage index, Census County Business Patterns data, BLS Area Wage surveys, and the BLS Consumer Price Index. The contractor compared changes by state in the physician full work GPCI to changes in potential update factors. However, since the work component is adjusted by only one-quarter of the GPCI, the impacts (both increases and decreases) of alternative data sources are reduced.

Wage series exist that can be used to revise the physician work GPCI and employee wage GPCI that may improve their accuracy on average compared with not revising over long periods of time, i.e. a decade. Accuracy means the state-

by-state closeness of change in a potential update series to changes in the physician full work GPCI from one Census to the next. However, while the average accuracy may improve, the accuracy of the GPCI may worsen for some states or payment localities. It should be noted that not all data sources have been fully evaluated and we will continue to analyze data to determine the most useful for the GPCIs.

See the enclosed contractor's report, "Updating the Geographic Practice Cost Index: Final Report (March 1995)," for more detailed information on the data series.

4. Costs of developing more accurate data:

The only data that might be more accurate than that which are currently used to calculate the GPCIs are primary data collected with specific primary sampling units that conform geographically with MFSAs. MFSAs represent 210 distinct geographic localities that do not often conform to standard Census geography. HCFA staff held informal meetings and discussions with Census Bureau staff and HUD staff regarding primary data collection using MFSAs, i.e., pricing localities as the primary sampling unit. The estimate was a minimum of $21 million to develop and to implement a one time survey. This might permit calculation of the GPCIs based on the survey rather than on proxies. It should also be noted, however, that gathering such primary data would not necessarily yield more accurate data than what are currently used, and as the GAO's 1993 report notes, would introduce theoretical indexing problems.

In summation, for the second GPCI review and revision for 1998 and 1999, HCFA intends further evaluation of the most promising data sources, short of collecting primary data on earnings and expenses. These efforts will include analyses using the BLS ES-202 series for hospital workers, the PPS hospital wage index, and perhaps Internal Revenue Service earnings data which were not available for the first update. To this end, a new competitive contract was awarded in June 1995 to conduct more in-depth analyses of data that might be used to update the income data between the 10-year decennial censuses.

I am also sending a copy of this letter report to the Speaker of the House of Representatives.

Sincerely,

Donna E. Shalala

Enclosure

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Sincerely,

Donna E. Shalala

Enclosure

HER HEALTH ECONOMICS RESEARCH, INC

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UPDATING THE GEOGRAPHIC PRACTICE COST INDEX

Final Report

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March 1995

This report was prepared under Contract No. 500-89-0050 from the Health Care Financing Administration to Health Economics Research, Inc. The helpful comments of our HCFA Project Officer, Sherry Terrell, Ph.D., as well as other HCFA staff, are gratefully acknowledged. The statements contained in this report are solely those of the authors and do not necessarily reflect the views or policies of the Health Care Financing Administration. The contractor assumes responsibility for the accuracy and completeness of the information contained in this report.

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EXECUTIVE SUMMARY

The Geographic Practice Cost Index (GPCI) is used to adjust Medicare Fee Schedule (MFS) payments for area variations in physicians' cost of practice. For payment purposes, physician expense categories are grouped into three GPCIs:

(1) the physician work GPCI, composed of an index of professional earnings from the Decennial Census.

(2) the practice expense GPCI, comprised of the nonphysician employee wage index, the office rental index, and the medical supplies, medical equipment, and miscellaneous expense categories. The nonphysician employee wage index is an index of employee earnings from the Decennial Census. The office rental index is an index of relative "fair market" (FMR) apartment rents published by the U.S. Department of Housing and Urban Development (HUD). No geographic variation in supplies, equipment, and miscellaneous categories is measured.

(3) the malpractice insurance GPCI, composed of relative premiums charged by insurers for physicians' malpractice insurance in different areas.

The sum of these GPCIs, weighted by their shares in the overall GPCI, is known as the Geographic Adjustment Factor, or GAF. One quarter of the variation in the physician work GPCI is used in the GAF (the "quarter work GPCI" as opposed to the "full work GPCI").

By law, the Health Care Financing Administration (HCFA) of the Department of Health and Human Services is required to use the best and most current data available to compute the GPCI. The GPCI has undergone a major "benchmark" revision using data from the 1990 Census, which is being implemented in calendar year 1995 and 1996 (Pope and Dayhoff, 1994; Pope et al., 1994; Zuckerman and Norton, 1994). HCFA is also required to review the GPCI every three years. This report considers periodic updates of the GPCI between major benchmark revisions based on the Decennial Censuses, which can be accomplished only every 10 years. The purpose of updating is to maintain a GPCI that accurately measures current differences across areas in physicians' cost of practice. The frequency of updating necessary to maintain an accurate GPCI depends on the volatility of the input prices it measures. Price volatility will vary by category of input.

Updating more frequently than is necessary to maintain an accurate index is undesirable for two reasons. First, updating changes MFS payments which may be disruptive to physicians or others paid under the MFS. Enough time should elapse between updates so that changes in the GPCI reflect actual changes in practice costs rather than random year-to-year variation in constituent data sources. Second, updating requires time and resources and increases the administrative burden on HCFA. A balance must be struck between frequent enough updating to maintain an accurate index, and the costs and disruptions involved with updating.

This report considers updating each of the four input price indices utilized in the GPCI:

1. professional earnings (work GPCI),
2. employee wages (nonphysician employee wage index),
3. HUD FMR apartment rents (office rental index), and
4. malpractice insurance premiums (malpractice GPCI).

We conclude that it would be acceptable to update the work GPCI and the nonphysician employee wage index only once every ten years with Decennial Census data. The lack of more frequent updating does not introduce substantial inaccuracy into the work or practice expense GPCIs, or into MFS payments. The average change across states in MFS payments from updating the work and employee indices with 1990 Census data (from 1980 Census data) is 0.6 percent and 1 percent, respectively. So the combined average change would be about 1.6 percent, assuming a perfect correlation between the two indices. Similarly, the largest combined change in payments for particular states or localities would be about 5 to 6 percent. Moreover, with the two year transition period specified by Congress, the largest annual change for any state or locality would be only 2 to 3 percent. These changes would seem to be within the "acceptable" range, that is, not so large as to be inexplicable or disruptive to physicians being paid under the MFS.

To be sure, if data series exist that could accurately track changes in the Census earnings indices between Decennial Censuses, updating could be desirable. We recommend further evaluation of data sources that could not be empirically analyzed for this report, because of the possibility that the inter-Census accuracy of the GPCI could be improved by these sources. These data include the BLS ES-202 series for hospital workers, the PPS hospital wage index, and perhaps IRS earnings data.

HUD publishes updated "fair market" rents annually. The GPCI office rental index could thus be updated every year. However, HUD actually resurveys rents in large

metropolitan areas only on a four-year cycle, and all rents are recalibrated only once every 10 years using the Decennial Census. Annual updates of the rental index would impose a large administrative burden relative to small gains in accuracy. Updating only every ten years, though, is probably too infrequent. Rents can be volatile (more so than wages) and the office rental index might become seriously out-of-date if it were updated only once every 10 years. (Over the six-year period 1987 to 1993, the largest changes in MFS payments implied by changes in the rental index are 2.5 to 3 percent. Payments to about one-tenth of all localities would change by more than 1 percent.)

A reasonable procedure would be to consider revising the GPCI office rental index on a four or five year cycle. If a five year cycle were adopted, every other update could coincide with an update of the work and rental GPCIs based on the Decennial Census. Five-year updates need not be automatic, but could occur only if changes in rents were large enough to justify the expense and disruptions of modifying the GPCI. The HUD FMR rental data could be reviewed on the three-year cycle required by Congress, and a change in the GPCI rental index considered if there were large changes in the FMRs subsequent to the last revision.

Relative malpractice insurance premiums are quite volatile, but malpractice's share of the GAF is small. The administrative burden of updating the malpractice GPCI is large because premium data are collected directly by HCFA (or its contractors) from numerous insurance companies. A reasonable compromise between accuracy and administrative burden would be to consider updating the malpractice GPCI on the same five year cycle as the rental index, with a three-year review cycle required by Congress.

In sum, our recommendations are:

- update the physician work GPCI and nonphysician employee wage index every 10 years based on Decennial Census data unless an accurate inter-censusal update series can be identified;

- consider updating the office rental index every five years based on the most recent HUD fair market rents with the FMR data monitored every three years for extraordinary changes; and

- consider updating the malpractice GPCI every five years based on the most recent three years of premium data collected from insurers, with the data monitored every three years for extraordinary changes.

UPDATING THE GEOGRAPHIC PRACTICE COST INDEX

1.0 INTRODUCTION

1.1 Background on the Geographic Practice Cost Index

The Geographic Practice Cost Index (GPCI) is an input price index used to adjust Medicare Fee Schedule (MFS) payments for area variations in physicians' cost of practice. The GPCI has seven components corresponding to categories of physician practice expenses:

(1) physician work,
(2) nonphysician employee wages,
(3) office rent,
(4) medical supplies,
(5) medical equipment,
(6) miscellaneous practice overhead expenses, and
(7) malpractice insurance premiums.

No measures of geographic variation in the cost of supplies, equipment, and miscellaneous inputs are available. Thus, the GPCI contains geographic indices of relative costs for four practice inputs: physician work, nonphysician employee work, office space, and malpractice insurance. For payment purposes, the categories are grouped into three GPCIs:

(1) the physician work GPCI;
(2) the practice expense GPCI, comprised of the nonphysician employee wage, office rental, medical supplies, medical equipment, and miscellaneous expense categories; and
(3) the malpractice insurance GPCI.

The sum of these GPCIs, weighted by their shares in the overall GPCI, is known as the Geographic Adjustment Factor, or GAF. One quarter of the variation in the physician work GPCI is used in the GAF ("quarter work GPCI" as opposed to "full work GPCI").

The GPCI was developed in the late 1980s and implemented with the Medicare Fee Schedule beginning in 1992. The original GPCI used the following data for its four component indices (Welch, Zuckerman, and Pope, 1989):

- Physician work: median hourly professional earnings from the 1980 Decennial Census;
- Nonphysician employee wages: median hourly earnings of clerical personnel, registered and licensed practical nurses, and medical technicians from the 1980 Census;
- Office rental: Fiscal year (FY) 1987 Fair Market apartment rents produced by the Department of Housing and Urban Development (HUD); and
- Malpractice insurance premiums: 1985 and 1986 premiums from a Health Care Financing Administration (HCFA) survey of insurers.

The GPCI recently underwent a major update, what might be termed a "benchmark revision", utilizing 1990 Census and other data (Pope and Dayhoff, 1994; Pope et al., 1994; Zuckerman and Norton, 1994). The following data are used in the revised GPCI:

- Physician work: median hourly professional earnings from the 1990 Decennial Census;
- Nonphysician employee wages: median hourly earnings of clerical personnel, registered and licensed practical nurses, and medical technicians from the 1990 Census;
- Office rental: Fiscal Year (FY) 1994 Fair Market apartment rents produced by the Department of Housing and Urban Development: and
- Malpractice insurance premiums: 1990, 1991, and 1992 premiums from a HCFA/Urban Institute survey of insurers.

One half the change in the revised GPCI was implemented January 1, 1995, with transition to the final GPCIs on January 1, 1996.

1.2 Criteria for Updating the GPCI

By law, HCFA is required to use the best and most current data available to compute the GPCI. HCFA is also required to review and consider updating the GPCI every three years. The primary purpose of updating, then, is to maintain a GPCI that accurately measures current differences across areas in physicians' cost of practice. The frequency of updating necessary to maintain an accurate GPCI depends on the volatility of the input prices it measures. Price volatility will vary by category of input. Relative malpractice premiums, for example, may change much more rapidly than relative employee wages. Then the malpractice GPCI would need to be updated more frequently to maintain currency than the employee GPCI.

Updating more frequently than is necessary to maintain an accurate index is undesirable for two reasons. First, updating changes MFS payments and may be disruptive to physicians or others paid under the MFS. Enough time should elapse between updates so that changes in the GPCI reflect

actual changes in practice costs rather than random year-to-year variation in constituent data sources. Second, updating requires time and resources and increases the administrative burden on HCFA. A balance must be struck between frequent enough updating to maintain an accurate index, and the costs and disruptions involved with updating.

1.3 Overview of Report

This report discusses alternatives for updating components of the GPCI on a regular basis. Chapter 2 considers updating the Census-wage-based physician work and employee indices. Chapters 3 and 4 discuss updating the office rental and malpractice indices, respectively. Updating the physician work and nonphysician employee indices more often than once a decade requires use of an additional data source because the Census data is available only every 10 years. HUD produces the FMRs every year, so the rental index can be updated as often as annually with the same data source. Updating the malpractice GPCI requires additional primary data collection of malpractice insurance premiums from insurers.

1.4 Cost Shares

Another element of the GPCI is the cost shares of the various practice inputs that are used to weight the GPCI components into an overall index.[1] These shares can also be updated over time as the shares of the various expense categories in total practice revenues change. We examined changes in the shares in an earlier report and do not consider them further here (Dayhoff, Schneider, and Pope, 1994). Changes in the shares over time are small and have only a minor effect on the GPCI.

The cost shares calculated by HCFA's Office of the Actuary from 1989 American Medical Association Socioeconomic Monitoring System survey data for the Medicare Economic Index (MEI) are being employed in the benchmark revision of the GPCI with 1990 Census data. We recommend continuing to use the same cost shares for the GPCI as are used for the MEI. Thus, the GPCI cost shares should be updated on the same schedule as the MEI shares.

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[1]Because the GPCI is separated into work, practice expense, and malpractice GPCIs in the payment formula, the only cost shares that actually affect payment are the practice overhead expense shares that are used to combine the nonphysician employee, office rental, supplies, equipment, and miscellaneous categories into the practice expense GPCI.

2.0 UPDATING THE PHYSICIAN WORK GPCI AND NONPHYSICIAN EMPLOYEE WAGE INDEX

Since the physician work GPCI and employee wage index are derived from Decennial Census data, a major "benchmark" update of these indices should take place every ten years when earnings data from a new Decennial Census becomes available. The special tabulation necessary to compute these indices should be available from the Bureau of the Census roughly three years after the beginning of each decade (i.e., in 1993, 2003, 2013, etc.). Allowing a year for computing and promulgating the revised GPCIs/GAFs, updated versions of the physician work and employee indices could be implemented roughly four years after the beginning of each decade (i.e., in 2004, 2014, etc.).

The major question is should these indices be updated between Decennial Censuses? Certainly the Census data is "old" even by the time an update is implemented. The revised physician work and employee indices to be implemented in 1995 will be based on 1989 data (the Decennial Census collects earnings data for the calendar year prior to the year beginning the decade). By the year 2000, the data on which the physician and employee indices are based will be 11 years out of date. However, whether an inter-Census update is warranted depends on two additional factors:

- How much do the physician and employee indices change between Censuses? If they change little, an update every ten years may be sufficient.
- Is another data source available that can be used to accurately update the two indices between Censuses?

Both these questions can now be addressed with the availability of 1980 and 1990 Census earnings data.

2.1 Magnitude of Changes Between Decennial Censuses in the Physician Work and Employee Wage Indices

Table 1 shows percentage changes in the physician work and employee wage indices between the 1980 Census and the 1990 Census. On average, the full variation state work GPCIs change by about 5 percent, implying an average change of about 1.2 percent in the quarter work GPCIs. Because the quarter work GPCI comprises about half of the overall GAF, updating the work GPCI with new Census data results in an average payment change of about 0.6 percent per state.

The average changes are small. However, for some states, the changes are larger. The maximum change in the full variation state work GPCI is about 14 percent. This corresponds to a 3.6 percent change in the quarter work GPCI, or about a 1.8 percent change in payments (the overall

TABLE 1

CHANGE IN THE PHYSICIAN WORK GPCI AND EMPLOYEE WAGE INDEX BETWEEN THE 1980 AND 1990 CENSUSES

	PHYSICIAN WORK GPCI			EMPLOYEE WAGE INDEX			COMBINED WORK AND EMPLOYEE
	Full Work GPCI	Quarter Work GPCI	Overall GAF[a]	Employee Wage Index	Practice Expense GPCI	Overall GAF[a]	Overall GAF[a]
State Average	5 %	1.2 %	0.6 %	6 %	2.4 %	1 %	1.6 %
Max State	14	3.6	1.8	22	9	3-4	5-6
Max Locality	16-20	4-5	2.4	23	9	3-4	5-6

[a] Change in overall payment, assuming no change in other components of the GAF.

GAF). For individual Medicare payment localities, the changes from updating are slightly larger. The largest full work GPCI changes are 16 to 20 percent, or a 4 to 5 percent change in the quarter work GPCI, or about a 2.4 percent increase or decrease in payments.

The changes in the employee wage index with new Census data are similar to those in the full work GPCI, but slightly larger. The average change across states is 6 percent. The largest changes for any state or payment locality are about 20 percent. The employee wage index accounts for about 40 percent of the practice expense GPCI, which in turn comprises about 40 percent of the overall GAF. Thus, the employee wage index comprises about 16 percent of the entire GAF. A 6 percent average change per state translates into about a 2.4 percent change in the practice expense GPCI, and a 1 percent average change in MFS payments due to updating the employee wage index. The maximum change in the practice expense GPCI resulting from updating the employee wage index with new Census data is about 9 percent, and the maximum payment change is 3.2 percent.

The physician work and employee indices are both earnings based indices. They differ in the mix of occupations included: professionals for the work GPCI and employees of physician offices for the employee wage index. Changes in the earnings of occupations in an area are highly correlated because they are affected by similar factors such as the strength of the local economy. Hence, areas that receive higher MFS payments due to an update in the physician work GPCI will also tend to receive higher payments due to a revised employee wage index. What is the combined effect on payments of updating both earnings-based indices?

The average change across states in MFS payments from updating the work and employee indices with 1990 Census data is 0.6 percent and 1 percent, respectively. So the combined average change would be about 1.6 percent, assuming a perfect correlation between the two indices. Similarly, the largest combined change in payments for particular states or localities would be about 5 to 6 percent.

These changes from updating with Decennial Census data every 10 years seem modest. Moreover, if a two year transition period is employed, as specified by Congress, the largest annual change for any state or locality would be only 2 to 3 percent. These changes would seem to be within the "acceptable" range, that is, not so large as to be inexplicable or disruptive to physicians being paid under the MFS. Of course, the entire analysis has assumed that the changes from updating 1980 Census earnings with 1990 Census earnings are representative of the changes that would occur in future updates at ten-year intervals. If relative wages by area change more rapidly in the future, the changes in the GAF could be larger. Also, the overall change in the GAF, and in MFS payments, could be amplified by changes in the other geographic indices, for office rent and malpractice insurance. The office rental index, in particular, is likely to be correlated with the earnings indices because rents as well as wages are affected by general economic conditions. However, the rental index can easily be

updated more frequently than every 10 years (see below), lessening the payment changes resulting from the 10 year "benchmark" updates based on the Decennial Censuses.

One other factor to keep in mind is that the payment changes resulting from updating the work GAF are greatly attenuated by the use of only one-quarter of the geographic variation in the professional earnings index (the work GPCI). If Congress were ever to replace the quarter variation work GAF with the full variation index, the payment changes from updating professional earnings with new Census data would be four times as large (e.g., about a 10 percent maximum as opposed to a 2.4 percent maximum).

In sum, we believe that it would be acceptable to update the Census wage-based indices only once every 10 years, when data from a new Decennial Census becomes available. The changes in the physician work GPCI and the employee wage index between Censuses are not so large that updating between Censuses is essential. Nevertheless, if it were possible to accurately trend changes in the two indices in the interval between Decennial Censuses, it might still be desirable to update them between Censuses. In the next section, we consider data sources that could be used to update the Census indices.

2.2 Data to Update the Census Wage Indices Between Censuses

Table 2 lists data sources that are candidates for updating the Census wage indices between Censuses, and some of their characteristics. The ideal data source for updating the work and employee GPCIs would:

- measure hourly earnings, wages, or total compensation in a statistically reliable fashion;
- measure the earnings of professional occupations (work GPCI), and/or physician office employees (employee GPCI);
- be as similar to the Census as possible in sample selection and questionnaire;
- be available at disaggregated geographic detail such as states, metropolitan areas (MSAs), or counties;
- be available with a short time lag; and
- not be dominated by any particular industry grouping, especially not manufacturing.

The Bureau of Economic Analysis's (BEA's) payroll per wage and salary worker is derived from the BLS's ES-202 data system, the same data used to construct the original hospital wage index used in Medicare's Prospective Payment System (PPS). Its several important advantages include the fact that it is a virtual census of all employers, it contains BEA estimates of earnings of self-employed

TABLE 2: DATA TO UPDATE CENSUS WAGE INDICES

Data Source	Definition	Geographic Disaggregation	Time Lag	Standard Error	Occupational Detail	Industry Detail	Comment
U.S. Department of Commerce, Bureau of Economic Analysis: ES-202 Data	Payroll per wage and salary worker; earnings per self-employed worker	State and county	8-9 months	No sampling error (census)	None	Detailed industry breakdown (2-digit SIC)	No control for hours worked or occupation mix changes.
U.S. Bureau of Labor Statistics: Current Population Survey	Usual weekly earnings of employed wage and salary workers who usually work full time	9 Census divisions and 10 largest states	< 6 months	about 1%	None	None	No control for occupation mix. Available by sex and race.
U.S. Bureau of Labor Statistics: Manufacturing Wage	Average hourly earnings of production workers on manufacturing payrolls	By state and large MSAs	< 2 months		None	Manufacturing industries only	
U.S. Department of Commerce, Bureau of Economic Analysis: Personal Per Capita Income	Total personal income divided by population	State and county	8-9 months		None	None	Reflects changes in unemployment and wages among those remaining employed. Includes non-labor income.
U.S. Internal Revenue Service: (SOI) Tax Return Data	Taxable gross and net income	State or below, subject to confidentiality restrictions	Requires special tabs by the IRS and there may be a lag of several years		Detailed occupations	Business as well as individual tax returns available	No control for weeks or hours worked.
U.S. Bureau of Labor Statistics: Employment Cost Index	Measures changes in total employer labor costs per hour	Only 4 regional update factors are available	< 6 months		None	Detailed industry breakdown	
U.S. Health Care Financing Administration: PPS Hospital Wage Index	Average hourly total compensation of hospital workers	MSA / state non-metro area	About 3 years	No sampling error (census)	None	Hospitals only	Subject to random fluctuation in small MSAs, may be more reliable at state level. Geographic reclass. of hospitals may need to be undone.
U.S. Bureau of the Census: County Business Patterns	Similar to ES - 202	County	2 - 3 years	No sampling error (census)	None	Detailed industry breakdown	Dominated by ES - 202, which is available sooner.
U.S. Bureau of Labor Statistics: Area Wage Surveys	Straight-time hourly earnings (does not include overtime, bonuses, etc.)	Incomplete geographic coverage (71 areas), mostly larger metro. areas	1- 2 years		Only certain occupations: office clerical, professional & technical, maintentance and custodial	Nonmanufacuring and manufacturing	Difficult to work with because of incomplete geographic coverage.
U.S. Bureau of Labor Statistics: Consumer Price Index	Measures changes in consumer prices	MSA population categories by 4 census regions	< 2 months		N.A.	N.A.	Price rather than wage measure

workers (such as self-employed professionals captured in the work GPCI),[2] it can be disaggregated to the county, and it is available with a short time lag. It dominates the similar Bureau of the Census County Business Patterns data for the latter reason. Its major disadvantages are that it does not measure hourly earnings, only payroll per employee, and no occupational detail is available. In addition, numbers of workers in particular industries are small for certain states, e.g., Wyoming and Vermont, leading to unstable estimates of payroll per worker. This problem could be ameliorated by using regional or contiguous state averages for less populous states.

We obtained diskettes from the U.S. Department of Commerce, Bureau of Economic Analysis that contained ES-202 payroll and employment data for 1- and 2-digit industries by state from 1979 to 1991. We focused on three industry classifications for wage and salary workers: all workers, service workers, and health services workers. It would also have been desirable to examine payroll per worker for hospitals, a more homogeneous industry category than the others. Unfortunately, hospitals are a 4-digit industry classification and were not contained on the BEA diskettes. We contacted the Bureau of Labor Statistics for data for hospitals. BLS does publish average wages per employee from ES-202 for "general medical and surgical hospitals", Standard Industrial Classification 8062. Unfortunately, published data for 4-digit industries begins in 1982, whereas we need 1979 data to be comparable to the Census. Obtaining 1979 data requires an expensive special tabulation of ES-202 by the BLS. Although we were not able to empirically evaluate the hospital series as a GPCI update factor, we recommend that it be analyzed in future work.

The Current Population Survey (CPS) is a monthly survey conducted by the Census Bureau and the Bureau of Labor Statistics (BLS). Although more detailed than the Census "long form" questionnaire, it is similar in most respects to the Census. Unfortunately, its sample size is much smaller than the Decennial Census, making CPS earnings estimates unreliable for small areas, such as metropolitan areas. Although earnings by occupation can be measured with the raw CPS computer tapes, choosing specific occupations (e.g., professionals or employees of physician offices) further reduces the already small sample size. For analysis of professional earnings by region as an update to the physician work GPCI, see Welch, Zuckerman, and Pope (1989). The conclusion of this previous report was that several years of CPS data would have to be merged to create update factors by region, and even then, significant random variation seemed to remain. Here we focus on a broad-based earnings measure from the CPS: usual weekly earnings of employed wage and salary workers who usually work full time. This statistic is published annually by the Bureau of Labor Statistics for the 9 Census Divisions and the 10 most populous states. Although the occupational mix is not specific to professionals (for the work GPCI) or physician office employees (for the employee GPCI), the larger

[2]In our empirical comparisons in the next section we present only the ES-202 wage and salary data, not including BEA's estimates of earnings of the self-employed. Including the earnings of the self-employed did not change the qualitative empirical findings.

sample size of all occupations should increase the reliability of the earnings estimates. If wages are correlated across occupations, this broad wage could still be an accurate update factor.

The BLS produces three other wage measures for geographic areas: the manufacturing wage, the employment cost index, and the area wage survey. The primary disadvantage of the hourly manufacturing wage is that changes in manufacturing wages may not be very highly correlated with changes in the wages of professionals or physician office employees. The employment cost index is only available for the four Census regions, an inadequate level of geographic detail. The geographic coverage of the area wage surveys are limited, a significant disadvantage because the GPCI must be computed for all areas. See Welch, Zuckerman, and Pope (1989) for some analysis of the area wage surveys as an update factor for the employee GPCI.

Earnings data reported on individual and business tax returns to the Internal Revenue Service may be available with a considerable time lag through special arrangement with the IRS. Wages and salaries and also occupation are reported on individual tax returns. Thus, changes in wages and salaries per tax return by occupation and geographic area could be examined. A major limitation, however, is the absence of hours or weeks worked. Further, tax returns might have to be limited to those with "single" or "married filing separately" filing status to be able to uniquely match wages/salaries with occupation.[3] Information from business tax returns of physicians and perhaps other professionals in sole proprietorships, partnerships, and corporations could be extracted, but also suffer from serious limitations. Physician income from the IRS is not an exogenous update factor for the physician work GPCI. Self-employed physician income includes an entrepreneurial return in addition to the opportunity cost of time (Pope and Dayhoff 1994). No control for hours worked is available to deflate business expenses for wages and salaries, nor is there any information on number and occupational mix of employees. Physician employees are confounded with nonphysician employees.

Per capita income is a possible update factor, but it incorporates non-labor income and also is sensitive to changes in the unemployment rate. The BLS Consumer Price Index (CPI) was considered by Welch, Zuckerman, and Pope (1989) as an update factor for the GPCI. The major disadvantages of the CPI are that it is only available by MSA population sizes for the four Census regions, and it is a price, not a wage measure.

The PPS hospital wage index is an intriguing candidate for providing GPCI update factors. It was rejected as the actual basis for the work or employee GPCIs because of its lack of an occupation mix correction and its unrepresentative occupational composition (hospital employees rather than

[3] If the IRS retains only total wages and salaries for married couples, it would be impossible to apportion earnings between two working spouses and their occupations. However, it might be possible to link occupation to wages and salaries through Social Security numbers on W-2 forms, which report wages and salaries for individual employees, and on 1040 forms, where occupation is recorded for both spouses.

professionals or physician office employees--see Zuckerman, Welch, and Pope, 1987). Nevertheless, changes in hospital wages could potentially provide accurate GPCI updates. In the 1990s, updated PPS wage indices will be available annually based on current wage information reported by hospitals on their Medicare Cost Reports. The PPS index's geographic coverage is extensive enough to allow wage change computations for MSAs and state rural areas, although the index has been somewhat unstable in small MSAs (Pope and Adamache, 1993). The geographic basis of the PPS wage index is currently uncertain as many rural hospitals have been reclassified into urban areas. Hospital-specific labor market areas may be adopted. Thus, to update the GPCI, primary data manipulation of the hospital wage files would probably be necessary.

In sum, based on data characteristics, three sources appear most promising for updating the work and employee GPCIs between Censuses: the BEA ES-202 data, the BLS Current Population Survey, and the PPS hospital wage index. In the next section, we compare changes by state from 1979 to 1989 in the first two of these sources and several of the others discussed above to changes in the work GPCI and employee wage index. Unfortunately, the PPS wage index was not calculated until the early 1980s, and its computation changed considerably during the 1980s, so we could not include it in our wage change comparisons in the next section. However, in section 2.4, we do compare an up-to-date PPS wage index and 1980 Census wage indices to 1990 Census wage indices to gain insight into the relative importance of recent wage data versus occupationally appropriate wage data.

2.3 Comparison of Changes in GPCIs to Changes in Potential Update Factors

Table 3 compares changes by state in the physician full work GPCI to changes in potential update factors between 1979 and 1989 (i.e., between the 1980 and 1990 Censuses).[4] The ideal update factor would have changed by the same amount in each state as the full work GPCI did. Then the average absolute deviation at the bottom of the table, which provides a summary indication of how closely changes in the potential update series tracked changes in the GPCI, would be zero. The larger the average absolute deviation, the less accurate the update factor. The average deviation of the 1980-Census-based from the 1990-Census-based work GPCI is 4.9 percent. If the average deviation of an update series exceeds this, updating would be less accurate than not updating at all for the average state.

Updating the work GPCI by any of the wage/income series would have resulted in a more accurate work GPCI, on average, than not updating at all (the average absolute deviations of all of the update series are less than 4.9 percent). However, the gains in average accuracy from updating are

[4]What is actually computed for Table 3 is the percentage change in the geographic wage index based on each data series from 1979 to 1989. That is, an index is constructed for each data series in 1979 and in 1989 with the population-weighted national average equal to 1.0. Then the percentage change in this index for each state is calculated and shown in Table 3.

TABLE 3

PERCENTAGE CHANGE BY STATE IN FULL WORK GPCI COMPARED TO ALTERNATIVE WAGE/ INCOME SERIES, 1979 - 1989

State	Full Work GPCI	BEA ES-202 Data: Wage and Salary for: All Workers	Services	Health Services	BLS Manufacturing Wage	CPS Weekly Earnings of Full-Time Wage and Salary Workers	BEA Per Capita Personal Income
Alabama	1.1%	-3.1%	0.2%	5.4%	-2.2%	-7.4%	1.3%
Alaska	-13.3%	-18.0%	-31.8%	-24.8%	-18.0%	-1.4%	-18.4%
Arizona	-1.0%	-3.8%	-1.8%	-2.0%	-4.2%	-5.8%	-5.3%
Arkansas	-4.8%	-5.2%	-1.3%	-5.3%	1.7%	-3.8%	-3.3%
California	0.0%	4.4%	2.8%	1.3%	1.5%	1.5%	-4.7%
Colorado	-5.0%	-3.1%	2.8%	-3.2%	-3.7%	-5.8%	-3.8%
Connecticut	14.3%	17.8%	17.3%	13.8%	11.5%	15.3%	15.9%
Delaware	-2.7%	-1.8%	1.3%	0.1%	12.2%	3.5%	7.8%
District of Columbia	-0.8%	8.1%	4.7%	5.8%	na	3.5%	-1.2%
Florida	0.0%	2.1%	1.2%	-0.8%	1.1%	0.2%	5.4%
Georgia	9.3%	4.6%	3.5%	7.9%	7.0%	3.5%	8.2%
Hawaii	-2.0%	2.0%	-0.7%	-1.5%	3.9%	-1.4%	0.1%
Idaho	-3.4%	-6.3%	-1.8%	-11.1%	-5.7%	-5.6%	-6.0%
Illinois	-6.5%	-2.8%	-6.4%	-4.4%	-1.8%	4.7%	-2.7%
Indiana	-3.2%	-9.3%	-4.2%	-4.8%	na	-6.2%	-5.8%
Iowa	-7.9%	-10.9%	-3.9%	-9.6%	-10.7%	-1.8%	-6.8%
Kansas	1.2%	-5.0%	-2.1%	-5.8%	1.8%	-1.8%	-7.3%
Kentucky	-3.3%	-10.0%	-1.4%	-3.3%	-2.1%	-7.4%	-3.7%
Louisiana	-3.2%	-10.7%	0.9%	-5.0%	2.1%	-3.8%	-12.1%
Maine	10.1%	5.3%	8.9%	8.2%	17.0%	15.3%	13.9%
Maryland	0.0%	6.1%	3.8%	4.6%	0.9%	3.5%	10.5%
Massachusetts	11.0%	15.4%	15.0%	13.1%	18.2%	15.3%	17.7%
Michigan	-5.3%	-6.5%	-11.8%	-9.0%	-1.1%	1.9%	-5.9%
Minnesota	-4.0%	0.6%	5.3%	1.7%	0.3%	-1.8%	-0.4%
Mississippi	-3.5%	-3.4%	0.1%	0.7%	3.7%	-7.4%	-4.3%
Missouri	0.0%	-3.8%	-2.1%	-3.0%	0.1%	-1.8%	-1.8%
Montana	-9.2%	-16.0%	-6.0%	-12.9%	-15.5%	-5.8%	-9.5%
Nebraska	-7.1%	-8.5%	-0.7%	-5.8%	-6.7%	1.8%	-4.8%
Nevada	-5.5%	-4.2%	-5.2%	-13.4%	-5.0%	-1.4%	-9.1%
New Hampshire	12.9%	12.4%	10.3%	12.5%	23.5%	15.3%	20.1%
New Jersey	4.4%	11.5%	4.7%	8.0%	8.4%	-1.2%	17.4%
New Mexico	-5.4%	-7.5%	-6.5%	-3.6%	4.2%	-5.8%	-8.5%
New York	5.3%	10.8%	-3.2%	3.0%	3.8%	2.7%	9.0%
North Carolina	-3.3%	4.1%	1.7%	-1.2%	10.5%	4.2%	8.9%
North Dakota	-9.3%	-12.6%	-0.7%	-7.7%	-5.9%	-1.8%	-13.2%
Ohio	2.2%	-6.8%	-5.8%	-6.4%	0.0%	-0.2%	-5.8%
Oklahoma	-1.1%	-7.6%	-5.4%	-6.4%	2.6%	-3.8%	-11.8%
Oregon	-1.1%	-10.4%	-0.5%	-7.7%	-12.7%	-1.4%	-9.8%
Pennsylvania	1.0%	-2.4%	2.3%	2.2%	-2.2%	1.9%	-0.4%
Rhode Island	3.6%	8.4%	7.2%	8.0%	13.6%	15.3%	9.2%
South Carolina	2.3%	1.8%	1.1%	0.4%	7.1%	3.5%	3.4%
South Dakota	-10.0%	-6.5%	2.7%	-5.5%	-6.9%	-1.8%	-7.9%
Tennessee	1.1%	-0.7%	0.6%	-0.5%	8.0%	-7.4%	3.9%
Texas	1.1%	-2.8%	-0.9%	-1.5%	1.4%	-1.0%	-9.7%
Utah	-6.2%	-7.5%	-2.0%	-2.1%	3.1%	-5.8%	-8.6%
Vermont	14.3%	6.4%	9.6%	5.4%	15.5%	15.3%	11.3%
Virginia	3.1%	8.1%	4.0%	8.4%	11.0%	3.5%	10.7%
Washington	-7.7%	-9.4%	-4.0%	-11.6%	-7.6%	-1.4%	-7.9%
West Virginia	-4.5%	-12.9%	-5.7%	-7.4%	-3.6%	3.5%	-10.9%
Wisconsin	-2.1%	-7.4%	-7.5%	-7.3%	-5.3%	-6.2%	-6.1%
Wyoming	-8.4%	-19.4%	-7.9%	-22.8%	1.3%	-5.8%	-24.6%
Average absolute deviation from GPCI change	**4.9%**	**4.3%**	**3.8%**	**3.7%**	**4.4%**	**4.0%**	**4.6%**

modest. The most accurate update series is the BEA ES-202 payroll per employee for health services. The percentage change in this index for the average state is 3.7 percentage points different from the change in the GPCI. Updating with this series reduces the average inaccuracy of the GPCI by about one-quarter over the decade ((4.9-3.7)/4.9), as compared with not updating. The next most accurate update factors are the ES-202 service workers' salary, then the CPS weekly earnings of wage and salary workers. The least accurate update factors, per capita income and the manufacturing wage, are only slightly better on average than not updating. Overall, the accuracy of these update factors is disappointing; even the best of them is not much better than not updating at all.

In addition, although on average updating does improve the accuracy of the GPCI somewhat, for individual states (or payment localities), it may worsen the GPCI's accuracy. For example, suppose the ES-202 health workers' salary, the most accurate of the update factors on average, were used to update the work GPCI between 1979 and 1989. In Wyoming, this series indicates a 23 percent reduction in the GPCI. In fact, the GPCI as measured using the Decennial Census, fell only 8 percent. If the GPCI were not updated, the 1980-Census-based GPCI would be only 8 percent different when replaced with the 1990 Census. If the ES-202 update were employed, the GPCI would have been 15 percent off when replaced by the 1990 Census. For other states, of course, the ES-202 health workers' series provides an accurate update. In Connecticut, for example, the work GPCI changed by 14 percent, the same percentage as the health workers' salary. The point is that even though updating the GPCI with one of the series in Table 3 may make the GPCI better on average and for most states, it can make the GPCI less accurate, perhaps substantially so, for some states. The policy decision is: is it worth incurring a reduction in the GPCI's accuracy in some states or payment localities to make it more accurate on average?

The greatest deviations of the changes in the update series from changes in the GPCI occur among the less populous states where small numbers of workers result in random error in measuring earnings. This problem could probably be ameliorated by replacing state changes by regional changes for the least populous states. However, updating may be less accurate than not updating even for some of the most populous states. For example, updating the New York work GPCI with either the all workers or the service workers ES-202 series would have been less accurate than not updating at all.

Table 4 is similar to Table 3, except the update series are compared to the employee wage index instead of the physician work GPCI. The results are somewhat more encouraging for the employee wage index. The best update series, the ES-202 all workers' salary, cuts the error in the wage index by about half after 10 years as compared with not updating. Updating by the ES-202 health and service workers' series, and the CPS weekly earnings series, also substantially improve the wage index's accuracy on average. However, each of these series reduces the wage index's accuracy for particular states as compared to not updating (e.g., Wyoming for the ES-202 series and Arizona for the CPS data).

TABLE 4

PERCENTAGE CHANGE BY STATE IN EMPLOYEE WAGE INDEX COMPARED TO ALTERNATIVE WAGE/ INCOME SERIES, 1979-1989

State	Employee Wage Index	BEA ES-202 Data: Wage and Salary for: All Workers	Services	Health Services	BLS Manufacturing Wage	CPS Weekly Earnings of Full-Time Wage and Salary Workers	BEA Per Capita Personal Income
Alabama	-5.1%	-3.1%	0.2%	5.4%	-2.2%	-7.4%	1.3%
Alaska	-10.9%	-18.0%	-31.8%	-24.6%	-16.0%	-1.4%	-18.4%
Arizona	1.2%	-3.8%	-1.8%	-2.0%	-4.2%	-5.6%	-5.3%
Arkansas	-5.5%	-5.2%	-1.3%	-5.3%	1.7%	-3.8%	-3.3%
California	2.9%	4.4%	2.8%	1.3%	1.5%	1.5%	-4.7%
Colorado	-3.3%	-3.1%	2.6%	-3.2%	-3.7%	-5.6%	-3.8%
Connecticut	21.8%	17.6%	17.3%	13.6%	11.5%	15.3%	15.9%
Delaware	4.1%	-1.6%	1.3%	0.1%	12.2%	3.5%	7.8%
District of Columbia	2.1%	8.1%	4.7%	5.8%	na	3.5%	-1.2%
Florida	4.2%	2.1%	1.2%	-0.8%	1.1%	0.2%	5.4%
Georgia	4.7%	4.6%	3.5%	7.9%	7.0%	3.5%	8.2%
Hawaii	0.9%	2.0%	-0.7%	-1.5%	3.9%	-1.4%	0.1%
Idaho	-6.3%	-6.3%	-1.8%	-11.1%	-5.7%	-5.6%	-6.0%
Illinois	-6.7%	-2.8%	-6.4%	-4.4%	-1.6%	4.7%	-2.7%
Indiana	-5.8%	-9.3%	-4.2%	-4.8%	na	-6.2%	-5.8%
Iowa	-10.1%	-10.9%	-3.9%	-9.6%	-10.7%	-1.8%	-6.6%
Kansas	-4.9%	-5.0%	-2.1%	-5.6%	1.8%	-1.8%	-7.3%
Kentucky	-5.2%	-10.0%	-1.4%	-3.3%	-2.1%	-7.4%	-3.7%
Louisiana	-4.8%	-10.7%	0.9%	-5.0%	2.1%	-3.8%	-12.1%
Maine	8.2%	5.3%	8.9%	6.2%	17.0%	15.3%	13.9%
Maryland	2.8%	6.1%	3.8%	4.6%	0.9%	3.5%	10.5%
Massachusetts	17.8%	15.4%	15.0%	13.1%	18.2%	15.3%	17.7%
Michigan	-9.0%	-8.5%	-11.8%	-9.0%	-1.1%	1.9%	-5.9%
Minnesota	0.1%	0.6%	5.3%	1.7%	0.3%	-1.8%	-0.4%
Mississippi	-5.9%	-3.4%	0.1%	0.7%	3.7%	-7.4%	-4.3%
Missouri	-3.6%	-3.8%	-2.1%	-3.0%	0.1%	-1.8%	-1.6%
Montana	-9.6%	-16.0%	-6.0%	-12.9%	-15.5%	-5.8%	-9.5%
Nebraska	-7.2%	-8.5%	-0.7%	-5.8%	-6.7%	-1.8%	-4.8%
Nevada	-1.0%	-4.2%	-5.2%	-13.4%	-5.0%	-1.4%	-9.1%
New Hampshire	13.4%	12.4%	10.3%	12.5%	23.5%	15.3%	20.1%
New Jersey	9.9%	11.5%	4.7%	8.0%	6.4%	-1.2%	17.4%
New Mexico	-4.8%	-7.5%	-6.5%	-3.6%	4.2%	-5.6%	-6.5%
New York	5.4%	10.8%	-3.2%	3.0%	3.8%	2.7%	9.0%
North Carolina	-1.7%	4.1%	1.7%	-1.2%	10.5%	4.2%	8.9%
North Dakota	-7.6%	-12.6%	-0.7%	-7.7%	-5.9%	-1.8%	-13.2%
Ohio	-0.8%	-6.8%	-5.8%	-6.4%	0.0%	-0.2%	-5.8%
Oklahoma	-5.9%	-7.6%	-5.4%	-6.4%	2.6%	-3.8%	-11.8%
Oregon	-4.6%	-10.4%	-0.5%	-7.7%	-12.7%	-1.4%	-9.8%
Pennsylvania	-0.9%	-2.4%	2.3%	2.2%	-2.2%	1.9%	-0.4%
Rhode Island	15.2%	8.4%	7.2%	6.0%	13.6%	15.3%	9.2%
South Carolina	0.6%	1.6%	1.1%	0.4%	7.1%	3.5%	3.4%
South Dakota	-7.5%	-6.5%	2.7%	-5.5%	-6.9%	-1.8%	-7.9%
Tennessee	-1.8%	-0.7%	0.6%	-0.5%	6.0%	-7.4%	3.9%
Texas	-2.9%	-2.8%	-0.9%	-1.5%	1.4%	-1.0%	-9.7%
Utah	-7.0%	-7.5%	-2.0%	-2.1%	3.1%	-5.6%	-6.6%
Vermont	11.2%	6.4%	9.6%	5.4%	15.5%	15.3%	11.3%
Virginia	0.4%	6.1%	4.0%	8.4%	11.0%	3.5%	10.7%
Washington	-3.9%	-9.4%	-4.0%	-11.6%	-7.6%	-1.4%	-7.9%
West Virginia	-8.1%	-12.9%	-5.7%	-7.4%	-3.6%	3.5%	-10.9%
Wisconsin	-7.3%	-7.4%	-7.5%	-7.3%	-5.3%	-6.2%	-6.1%
Wyoming	-7.9%	-19.4%	-7.9%	-22.8%	1.3%	-5.8%	-24.6%
Average absolute deviation from GPCI change	**6.0***	**3.1%**	**3.8%**	**3.6%**	**4.9%**	**3.6%**	**4.1%**

Table 5 shows update factors for the GPCI from 1989 to 1991 derived from the various wage or income series. 1991 data was the most recent available when this report was prepared and 1989 is the year the 1990 Census collected earnings data for. Thus, Table 5 shows update factors that could be used to move the work GPCI or employee wage index forward from 1989 to 1991. Not surprisingly, the update factors are much smaller on average and at the extremes for this two-year period than they are for the 10 years 1979 to 1989. The largest change in the ES-202 all workers index, for example, is a 4 percent decline in Alaska. No measure of the accuracy of any of these update factors can be computed.

2.4 PPS Wage Index and 1980 and 1990 Census Wage Indices

Because the PPS wage index did not exist in 1979, we could not compare changes in it to changes in the Census wage indices. However, as some indication of the usefulness of the PPS wage index as an update factor for the work GPCI and practice expense GPCI employee wage index, we produced Tables 6 and 7. The goal of Tables 6 and 7 was to determine the relative importance of up-to-date wage data (as embodied in the PPS wage index) versus occupationally-specific and adjusted wage data (as embodied in the Census wage indices). To gain insight into this tradeoff, we made two comparisons, with the 1996 GPCI (based on the 1990 Census) taken as the "gold standard". One comparison is between the PPS wage index and the 1996 GPCI, with each based on wage data from a similar year. A second comparison is between the 1992 and 1996 GPCIs. The two GPCIs are constructed using a similar methodology, but the 1992 GPCI is based on wage data that is ten years older (1979 versus 1989 wages). - the PPS wage index is more similar to the 1996 GPCI, that would mean that current wage data is more important than occupationally appropriate data; conversely, if the 1992 GPCI is more similar to the 1996 GPCI, that would mean that occupationally adjusted and appropriate wage data is more important than recent data. The similarity of the PPS wage index and 1992 GPCI to the 1996 GPCI is measured by their average absolute deviation from the 1996 GPCI across states. Comparisons are made both for the full work GPCI (Table 6), and the employee wage index (Table 7). The PPS wage index is computed with FY 1991 data to be comparable to the 1996 GPCI, which is based on 1989 wage data from the 1990 Census.

The full work GPCI comparisons produce virtually a dead heat. The average absolute deviations across states of the PPS wage index and the 1992 work GPCI from the 1996 GPCI are almost the same, 4.6 percent and 4.5 percent (see Table 6). In contrast, the employee wage index comparisons show that more recent data is more important, as the average absolute deviation of the PPS wage index from the 1996 employee wage index is only 3.8 percent, compared to a 5.7 percent average deviation of the 1992 employee wage index from the 1996 employee wage index (see Table 7). Examination of state differences shows how recent data can be important. The New England states

TABLE 5

PERCENTAGE CHANGE BY STATE IN ALTERNATIVE WAGE/ INCOME SERIES, 1989 - 1991

State	BEA ES-202 Data: Wage and Salary for: All Workers	Services	Health Services	BLS Manufacturing Wage	CPS Weekly Earnings of Full-Time Wage and Salary Workers	BEA Per Capita Personal Income
Alabama	0.1%	0.3%	0.2%	0.1%	0.6%	3.3%
Alaska	-4.0%	-0.2%	-4.4%	-11.0%	2.0%	-1.6%
Arizona	-2.0%	-1.1%	-1.4%	1.1%	0.9%	-1.0%
Arkansas	0.2%	-1.7%	-0.5%	0.0%	0.1%	3.4%
California	1.4%	1.2%	1.6%	na	0.2%	-1.9%
Colorado	0.7%	0.2%	2.3%	1.7%	0.9%	1.1%
Connecticut	2.1%	2.0%	2.7%	0.3%	3.0%	-1.2%
Delaware	0.9%	-1.7%	0.5%	-7.5%	0.1%	-0.9%
District of Columbia	1.6%	2.5%	0.4%	na	0.1%	0.4%
Florida	0.5%	-2.1%	-0.9%	0.6%	-1.0%	-1.9%
Georgia	1.0%	-0.4%	2.0%	1.0%	0.1%	0.0%
Hawaii	2.7%	0.0%	1.4%	3.0%	2.0%	4.6%
Idaho	0.1%	-1.4%	-1.2%	2.0%	0.9%	0.6%
Illinois	-0.4%	-0.5%	-0.6%	-2.3%	-3.2%	-0.1%
Indiana	-1.2%	0.5%	0.9%	-0.4%	1.7%	-0.2%
Iowa	-0.6%	0.0%	-0.1%	0.7%	-1.2%	1.1%
Kansas	-0.9%	-0.1%	-0.9%	-1.3%	-1.2%	3.0%
Kentucky	0.5%	1.5%	1.7%	-0.6%	0.6%	3.6%
Louisiana	0.4%	-1.5%	-0.8%	-0.1%	0.1%	5.5%
Maine	-0.3%	-0.3%	-0.4%	4.7%	3.0%	-1.2%
Maryland	1.2%	-0.5%	0.1%	-0.1%	0.1%	-1.6%
Massachusetts	1.5%	0.7%	1.8%	1.6%	3.0%	-2.2%
Michigan	-3.3%	0.7%	-1.7%	0.7%	2.1%	-1.9%
Minnesota	-0.9%	0.2%	-0.6%	-1.4%	-1.2%	-0.6%
Mississippi	-0.5%	-2.1%	0.8%	1.2%	0.6%	3.3%
Missouri	-0.7%	-0.9%	-0.2%	-3.0%	-1.2%	0.2%
Montana	-0.5%	-0.9%	-0.5%	-2.7%	0.9%	2.8%
Nebraska	0.7%	2.8%	1.1%	-3.2%	-1.2%	2.6%
Nevada	-0.4%	-2.0%	-2.1%	0.2%	2.0%	-2.4%
New Hampshire	0.1%	0.8%	0.0%	-2.0%	3.0%	-1.3%
New Jersey	2.6%	2.0%	1.8%	2.1%	16.3%	-0.1%
New Mexico	-0.3%	-1.8%	-1.7%	0.8%	0.9%	2.1%
New York	0.7%	1.7%	-0.5%	0.4%	7.6%	-0.2%
North Carolina	0.0%	-0.5%	0.2%	2.3%	-7.3%	0.5%
North Dakota	-0.9%	-1.0%	-2.0%	-1.5%	-1.2%	5.8%
Ohio	-1.5%	-1.6%	-0.7%	0.3%	-7.2%	-0.3%
Oklahoma	-1.4%	-2.1%	-3.2%	-0.8%	0.1%	0.9%
Oregon	1.2%	0.3%	0.8%	0.0%	2.0%	0.7%
Pennsylvania	0.1%	-0.5%	0.1%	0.8%	-2.9%	1.4%
Rhode Island	0.0%	0.5%	-1.7%	0.7%	3.0%	-1.8%
South Carolina	0.1%	1.1%	0.4%	0.7%	0.1%	3.3%
South Dakota	0.3%	1.3%	0.4%	-0.7%	-1.2%	6.1%
Tennessee	0.2%	-3.1%	-0.6%	0.9%	0.6%	1.9%
Texas	0.5%	-0.5%	0.3%	-0.9%	-0.5%	2.1%
Utah	-1.1%	-0.3%	-2.0%	-0.4%	0.9%	2.8%
Vermont	0.1%	0.6%	0.8%	3.2%	3.0%	-1.2%
Virginia	-0.1%	-1.2%	0.2%	0.9%	0.1%	-1.6%
Washington	2.2%	3.4%	6.6%	1.6%	2.0%	2.1%
West Virginia	-1.3%	-1.4%	-1.4%	-1.2%	0.1%	4.3%
Wisconsin	-0.6%	1.7%	0.0%	-0.2%	1.7%	0.5%
Wyoming	-1.4%	-4.2%	-2.7%	-2.7%	0.9%	4.2%

TABLE 6

COMPARISON OF PPS WAGE INDEX (FY 1991 DATA) TO 1992 AND 1996 FULL WORK GPCIs
(1979 AND 1989 DATA, RESPECTIVELY)

State	PPS Wage Index	1996 Full Work GPCI	1992 Full Work GPCI	Difference, 1992 From 1996 GPCI	Difference, PPS Index From 1996 GPCI
ALABAMA	0.801	0.914	0.902	-0.012	-0.113
ALASKA	1.286	1.250	1.426	0.176	0.036
ARIZONA	0.973	0.979	0.988	0.009	-0.006
ARKANSAS	0.758	0.812	0.842	0.030	-0.054
CALIFORNIA	1.249	1.130	1.145	0.015	0.119
COLORADO	0.966	0.951	0.997	0.046	0.015
CONNECTICUT	1.205	1.198	1.057	-0.141	0.007
DELAWARE	1.029	1.078	1.103	0.025	-0.049
DISTRICT OF COLUMBIA	1.206	1.199	1.236	0.037	0.007
FLORIDA	0.942	0.949	0.952	0.003	-0.007
GEORGIA	0.904	0.939	0.864	-0.075	-0.035
HAWAII	1.128	0.993	1.012	0.019	0.135
IDAHO	0.851	0.840	0.866	0.026	0.011
ILLINOIS	0.979	1.005	1.077	0.072	-0.026
INDIANA	0.912	0.925	0.960	0.035	-0.013
IOWA	0.822	0.834	0.901	0.067	-0.012
KANSAS	0.872	0.852	0.834	-0.018	0.020
KENTUCKY	0.838	0.880	0.915	0.035	-0.042
LOUISIANA	0.869	0.912	0.946	0.034	-0.043
MAINE	0.907	0.874	0.796	-0.078	0.033
MARYLAND	0.991	1.045	1.092	0.047	-0.054
MASSACHUSETTS	1.150	1.101	1.002	-0.099	0.049
MICHIGAN	1.047	1.088	1.147	0.059	-0.041
MINNESOTA	0.998	0.957	0.994	0.037	0.041
MISSISSIPPI	0.896	0.826	0.853	0.027	-0.130
MISSOURI	0.879	0.892	0.908	0.016	-0.013
MONTANA	0.839	0.803	0.869	0.066	0.036
NEBRASKA	0.885	0.800	0.841	0.041	0.085
NEVADA	1.107	1.023	1.110	0.087	0.084
NEW HAMPSHIRE	1.016	0.950	0.849	-0.101	0.066
NEW JERSEY	1.112	1.181	1.137	-0.044	-0.069
NEW MEXICO	0.910	0.896	0.925	0.029	0.014
NEW YORK	1.237	1.194	1.159	-0.035	0.043
NORTH CAROLINA	0.879	0.881	0.866	-0.015	-0.002
NORTH DAKOTA	0.837	0.799	0.860	0.061	0.038
OHIO	0.932	0.961	0.972	0.011	-0.029
OKLAHOMA	0.795	0.874	0.878	0.004	-0.079
OREGON	1.042	0.891	0.919	0.028	0.151
PENNSYLVANIA	1.009	1.005	1.002	-0.003	0.004
PUERTO RICO	0.439	0.526	0.526	0.000	-0.087
RHODE ISLAND	1.084	1.072	1.035	-0.037	0.012
SOUTH CAROLINA	0.852	0.900	0.882	-0.018	-0.048
SOUTH DAKOTA	0.772	0.739	0.803	0.064	0.033
TENNESSEE	0.881	0.901	0.877	-0.024	-0.040
TEXAS	0.902	0.936	0.933	-0.003	-0.034
UTAH	0.944	0.909	0.971	0.062	0.035
VERMONT	0.926	0.891	0.770	-0.121	0.035
VIRGINIA	0.887	0.940	0.905	-0.035	-0.053
WASHINGTON	1.047	0.956	1.035	0.079	0.091
WEST VIRGINIA	0.824	0.853	0.890	0.037	-0.029
WISCONSIN	0.893	0.924	0.950	0.026	-0.031
WYOMING	0.800	0.868	0.951	0.083	-0.068
AVERAGE ABSOLUTE DIFFERENCE	–	–	–	0.045	0.046

TABLE 7

COMPARISON OF PPS WAGE INDEX (FY 1991 DATA) TO 1992 AND 1996 PRACTICE EXPENSE GPCI EMPLOYEE WAGE INDICES (1979 AND 1989 DATA, RESPECTIVELY)

State	PPS Wage Index	1996 Employee Wage Index	1992 Employee Wage Index	Difference, 1992 From 1996 Employee Wage Index	Difference, PPS Index From 1996 Employee Wage Index
ALABAMA	0.801	0.858	0.905	0.047	-0.057
ALASKA	1.286	1.267	1.437	0.170	0.019
ARIZONA	0.973	0.954	0.934	-0.020	0.019
ARKANSAS	0.758	0.826	0.857	0.031	-0.068
CALIFORNIA	1.249	1.152	1.123	-0.029	0.097
COLORADO	0.988	0.955	0.982	0.027	0.011
CONNECTICUT	1.205	1.249	1.028	-0.221	-0.044
DELAWARE	1.029	1.081	1.009	-0.052	-0.032
DISTRICT OF COLUMBIA	1.205	1.190	1.165	-0.025	0.016
FLORIDA	0.942	0.951	0.914	-0.037	-0.009
GEORGIA	0.904	0.962	0.923	-0.039	-0.058
HAWAII	1.128	1.054	1.051	-0.003	0.074
IDAHO	0.851	0.852	0.907	0.055	-0.001
ILLINOIS	0.979	0.997	1.075	0.078	-0.018
INDIANA	0.912	0.911	0.970	0.059	0.001
IOWA	0.822	0.840	0.918	0.078	-0.018
KANSAS	0.872	0.883	0.915	0.032	-0.011
KENTUCKY	0.838	0.862	0.925	0.063	-0.024
LOUISIANA	0.869	0.910	0.955	0.045	-0.041
MAINE	0.907	0.949	0.871	-0.078	-0.042
MARYLAND	0.991	1.050	1.062	0.012	-0.059
MASSACHUSETTS	1.150	1.193	1.015	-0.178	-0.043
MICHIGAN	1.047	1.020	1.126	0.106	0.027
MINNESOTA	0.998	0.979	0.969	-0.010	0.019
MISSISSIPPI	0.696	0.807	0.872	0.065	-0.111
MISSOURI	0.879	0.904	0.948	0.044	-0.025
MONTANA	0.839	0.838	0.918	0.080	0.001
NEBRASKA	0.885	0.827	0.873	0.046	0.058
NEVADA	1.107	1.027	1.055	0.028	0.080
NEW HAMPSHIRE	1.018	1.020	0.908	-0.112	-0.004
NEW JERSEY	1.112	1.156	1.062	-0.094	-0.044
NEW MEXICO	0.910	0.874	0.903	0.029	0.036
NEW YORK	1.237	1.175	1.127	-0.048	0.062
NORTH CAROLINA	0.879	0.923	0.891	-0.032	-0.044
NORTH DAKOTA	0.837	0.838	0.887	0.049	-0.001
OHIO	0.932	0.964	1.007	0.043	-0.032
OKLAHOMA	0.795	0.881	0.914	0.033	-0.086
OREGON	1.042	0.953	1.013	0.060	0.089
PENNSYLVANIA	1.009	0.997	1.007	0.010	0.012
PUERTO RICO	0.439	0.498	0.545	0.047	-0.059
RHODE ISLAND	1.064	1.100	0.955	-0.145	-0.018
SOUTH CAROLINA	0.852	0.887	0.875	-0.012	-0.035
SOUTH DAKOTA	0.772	0.800	0.832	0.032	-0.028
TENNESSEE	0.881	0.896	0.896	0.000	-0.035
TEXAS	0.902	0.916	0.950	0.034	-0.014
UTAH	0.944	0.879	0.935	0.056	0.065
VERMONT	0.926	0.969	0.872	-0.097	-0.043
VIRGINIA	0.887	0.924	0.928	0.004	-0.037
WASHINGTON	1.047	1.007	1.051	0.044	0.040
WEST VIRGINIA	0.824	0.844	0.922	0.078	-0.020
WISCONSIN	0.893	0.920	0.989	0.069	-0.027
WYOMING	0.800	0.879	0.956	0.077	-0.079
AVERAGE ABSOLUTE DIFFERENCE	–	–	–	0.057	0.038

experienced strong wage growth in the 1980s, and in these states, the more recent PPS wage index is much closer to the 1996 GPCI than is the 1992 GPCI. For example, Connecticut's PPS wage index is 1.205, close to its 1996 GPCI employee wage index of 1.249, but its 1992 GPCI employee wage index is only 1.028. On the other hand, some wage patterns are consistent between the 1996 and 1992 GPCI indices, but not the PPS wage index, showing that occupationally appropriate data is also important. For example, the 1996 GPCI California employee wage index is 1.152, compared to a 1992 GPCI index of 1.123, but the California PPS index is considerably higher at 1.249.

These results, then, suggest that both recent and occupationally appropriate wage data are important. Updating the Census wage data between Decennial Censuses could improve the accuracy of the GPCI (by up to 5 to 6 percent) in areas that are experiencing rapid relative wage growth (or decline), such as New England during the 1980s. The results also suggest that changes in the PPS wage index could be useful update factors for the GPCI. The PPS index, for instance, seems to have captured the growth in New England wages that occurred during the 1980s. We recommend further evaluation of the PPS index as an update factor for the GPCIs.

2.5 Summary

Wage series exist that can be used to update the physician work GPCI and employee wage index, and that will improve their accuracy on average by as compared with not updating over long periods of time (e.g., a decade). However, updating is likely to worsen the accuracy of the GPCI for some states or payment localities. Over short periods of time (e.g., less than 5 years), updating the work GPCI or employee wage index will have a small effect on them and on MFS payments, and may or may not improve the accuracy of the GPCI on average. If the two indices are updated only once every 10 years by new Decennial Census data, the largest changes in MFS payments at the time of updating are likely to be moderate (5 to 6 percent maximum for any payment locality).

We conclude that it would be acceptable to update the physician work GPCI and employee wage index only once every 10 years with Decennial Census data. The lack of more frequent updating does not introduce substantial inaccuracy into the work or practice expense GPCIs, or into MFS payments. We do, however, recommend further evaluation of data sources that could not be empirically analyzed for this report, because of the possibility that the inter-Census accuracy of the GPCI could be improved by these sources. These data include the BLS ES-202 series for hospital workers, the PPS hospital wage index, and perhaps IRS earnings data.

3.0 UPDATING THE OFFICE RENTAL INDEX

The office rental index of the practice expense GPCI is derived from the Fair Market Rents (FMRs) compiled by the Department of Housing and Urban Development (HUD).[5] HUD publishes revised Fair Market Rents (FMRs) annually (generally in the October 1 *Federal Register*). Although the office rental index could be updated annually with new FMRs, HUD does not actually resurvey the entire set of FMRs each year.

HUD uses three data sources to establish base-year FMRs (*Federal Register*, May 6, 1993, p. 27063): (1) the 1990 Census; (2) the Random Digit Dialing (RDD) telephone surveys conducted since the Census; and (3) the post-1990 American Housing Surveys (AHS) conducted by the Bureau of the Census for HUD. The base-year FMRs are updated with: (1) the Consumer Price Index (CPI) rent and utility index for the 95 metropolitan FMR areas for which the CPI is available; or (2) the 10 metropolitan/nonmetropolitan HUD regional rent change factors developed from RDD surveys. AHSs are conducted for 44 of the largest metropolitan areas on a revolving schedule of 11 areas annually. They allow HUD to update the FMRs for large metropolitan areas between Decennial Censuses. Approximately 60 individual FMR areas (MSAs or nonmetropolitan counties) are revised each year on the basis of the RDD surveys.

What implications do the procedures HUD uses to update the FMRs have for updating the office rental index? All FMRs are changed each year based on the CPIs or RDD update factors. However, rents in all areas are actually resurveyed only once every 10 years based on the Decennial Census. Rents in large metropolitan areas are recalibrated more frequently, every four years, through the AHSs. Some other areas are also resurveyed each year through the RDD surveys. Changes in the office rental index due to the annual CPI or RDD updates to the FMRs tend to be small. The RDD or AHS resurveys of particular areas can lead to more substantial changes, although only in a small proportion of areas each year. The 10 year "benchmark" revisions based on the Decennial Census can lead to substantial changes in the office rental index in many areas.

In an earlier analysis (Pope, et al., 1994), we compared changes in rental indices based on the 1987 and 1993 FMRs. The largest changes for particular Medicare payment localities were 25-30 percent. Twenty-two localities changed by more than 10 percent. The rental index comprises about 10 percent of the overall payment GAF. Thus, the largest changes in MFS payments resulting from changes in the rental index over this six-year period would be 2.5 to 3 percent. Payments to about one-tenth of all localities would change by more than 1 percent.

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[5]Data on relative county rents within Consolidated Metropolitan Statistical Areas from a HUD special tabulation of 1990 Census rents is also utilized in the office rental index of the 1996 practice expense GPCI. It is probably not possible to update these county rental factors between Decennial Censuses.

Annual updating of the office rental index is unnecessary. The administrative burden of annual updates on HCFA would be high, and the gains in the accuracy of the office rental index would be small. However, updating the rental index only once every 10 years is probably too infrequent. Rents can be volatile (more so than wages) and the office rental index could become seriously out-of-date if it were updated only once every 10 years. Also, HUD produces accurate inter-censual updates to the FMRs that can be incorporated into the GPCI. A reasonable procedure would be to update the office rental index every four to five years. Over a four-year period, the FMRs of all of the 44 largest metropolitan areas are resurveyed through the AHSs. The office rental index should also be revised to be consistent with HUD's benchmark revision of the FMRs based on the Decennial Census. This update could be accomplished at the same time as the update of the physician work GPCI and employee wage index.

The transitional updated GPCIs were implemented in the MFS on January 1, 1995, and the final GPCIs will be effective January 1, 1996. Congress has required that HCFA consider revising the GPCI every three years. It would be reasonable to consider updating the office rental index in 1998 or 1999, then again in 2003, based on HUD's incorporation of data from the 2000 Decennial Census into the FMRs.

4.0 UPDATING THE MALPRACTICE GPCI

Updating the malpractice GPCI raises a somewhat different set of issues than the other components of the GAF. The primary reason for this is that it requires a survey of insurers in order to gather the primary data upon which it is based. The other GPCIs are computed from secondary sources whose availability cannot be controlled by HCFA. Therefore, in the case of the malpractice GPCI, HCFA must make decisions about both how frequently to collect premium data from insurers and how frequently to use these data to update the index. Past research suggests that there is sufficient volatility in the malpractice GPCI so that infrequent updating could result in an index that is inaccurate for many of the years for which it is used. In addition, when updating would occur, it is likely that there would be large changes in malpractice index values for many areas, although not necessarily for the entire GAF since the malpractice GPCI comprises only 4.8 percent of the GAF.

There is one major point that needs to be kept in mind when considering how to update the malpractice GPCI. The dramatic changes in the index values associated with moving from the index currently being used (1992 GPCI) in the MFS to one based on the 1990, 1991, and 1992 premium data collected by the Urban Institute (1996 GPCI) should not be viewed as typical of future changes resulting from updating. Many of the largest changes were the result of replacing data that was not representative of a state's malpractice costs with data that better captures these costs (Zuckerman and Norton, 1994).

In order to assess the impact of future updates, this chapter must limit its analysis to data collected by the Urban Institute's state-based survey approach (Zuckerman, Norton, and Wadler, 1992). Unfortunately, this means that only data from the 1989-1992 period can be considered. The simplest approach to measuring the effects of updating is to compare the 1996 malpractice GPCI, which is based on 20 specialties and a three-year average of premiums, to a similar index based on an earlier time period. In this instance, that means comparing an index based on 1989-1991 data to one based on 1990-1992 data.

The results of this comparison are presented in Table 6 on a state-by-state basis. As can be seen, the impact of updating the index by one year is small compared to the effects of altering the sample of companies. However, it is still the case that seven states would experience changes in their index values of greater than 10 percentage points.[6] Another 14 states would experience changes of between 5 and 10 percentage points. This suggests that

[6]It may be worth noting that in three of these states--Kansas, Louisiana, and Massachusetts--the changes in malpractice GPCI values are the direct result of changes in either the surcharges applied to premiums to fund Patient Compensation Funds (PCFs) or assessments for retroactive premium shortfalls. This suggests that some of the volatility observed is not solely due to fluctuations in the underlying premiums.

TABLE 8

IMPACT ON MALPRACTICE GPCI OF SUBSTITUTING 1990-92 MALPRACTICE PREMIUMS FOR 1989-91 PREMIUMS (ASCENDING ORDER OF CHANGE)

State	1989-91 Malpractice GPCI	1990-92 Malpractice GPCI	Change
Massachusetts	1.159	1.016	-0.143
Kansas	1.369	1.240	-0.129
Alaska	1.805	1.681	-0.124
Maine	0.892	0.790	-0.102
Minnesota	0.710	0.616	-0.092
Delaware	0.899	0.824	-0.075
Arizona	1.444	1.373	-0.071
Florida	1.829	1.759	-0.070
Iowa	0.774	0.706	-0.068
South Dakota	0.522	0.461	-0.061
Oregon	0.721	0.663	-0.058
Missouri	1.287	1.231	-0.056
Montana	0.840	0.787	-0.053
North Dakota	0.892	0.841	-0.051
New Mexico	0.868	0.823	-0.045
Virginia	0.621	0.580	-0.041
Nebraska	0.500	0.462	-0.038
Washington	0.813	0.778	-0.035
South Carolina	0.407	0.375	-0.032
Colorado	0.882	0.860	-0.022
Arkansas	0.465	0.444	-0.021
Rhode Island	1.651	1.632	-0.019
Vermont	0.485	0.470	-0.015
Georgia	0.952	0.939	-0.013
Idaho	0.623	0.612	-0.011
Illinois	1.198	1.191	-0.007
Mississippi	0.762	0.756	-0.006
California	0.704	0.699	-0.005
North Carolina	0.458	0.453	-0.005
Connecticut	1.045	1.041	-0.004
Utah	0.672	0.669	-0.003
Indiana	0.370	0.368	-0.002
Alabama	0.966	0.964	-0.002
Kentucky	0.852	0.852	0.000
Oklahoma	0.496	0.501	0.005
New York	1.431	1.436	0.005
Tennessee	0.536	0.544	0.008
West Virginia	1.036	1.044	0.008
Wyoming	0.836	0.844	0.009
Hawaii	0.947	0.956	0.010
Puerto Rico	0.269	0.279	0.010
Pennsylvania	0.933	0.946	0.013
Nevada	0.909	0.922	0.013
New Jersey	0.770	0.792	0.022
Wisconsin	1.161	1.207	0.046
Maryland	1.010	1.065	0.055
New Hampshire	0.895	0.952	0.057
Texas	0.940	1.009	0.069
District of Columbia	1.126	1.202	0.076
Michigan	2.400	2.500	0.100
Louisiana	0.866	0.971	0.105
Ohio	0.976	1.095	0.119

using a representative set of companies, an expanded set of specialties, and a three-year average of premiums does not smooth out all annual fluctuations. Even annual updating (as simulated in Table 6), would still result in non-negligible changes in the malpractice GPCI. Fortunately, since this index is less than 5 percent of the overall GAF, the impact of these fluctuations on payment rates would be minimal, i.e., less than one percentage point.

The effort involved in collecting these data annually also needs to be assessed. The process has three parts. First, state insurance departments need to be contacted to verify the representativeness of the insurers that have been surveyed in the past and to identify new contact people (as relevant). Second, the insurers need to be surveyed. Telephone surveys that solicited hard copy data have been used successfully. Response rates have ultimately been 100 percent. There were instances, however, in which insurers needed to receive numerous followup calls, while others needed written requests. This is a labor-intensive process. Conceivably, some of the time involved could be cut by using the mail for initial contacts. Our experience suggests, though, that some (possibly many) companies will still need to be contacted by telephone. In addition, there were always companies who provided incomplete or incorrect data that needed to be resurveyed.

Once the data has been received, a data base for use in the analysis needs to be created. This third phase of the process depends on how the data are going to be used. In our analysis, we have structured a final data base around specialty and county (as the basic geographic unit). Initially, files need to be created that present premiums by company for each risk class (group of specialties) and rating area. These can then be mapped to specialties and counties depending on each company's risk classification and geographic schemes. This has not been entirely mechanical from year to year, because companies change how specialties are classified and which areas are designed as high- or low-cost. In order to avoid errors, all companies need to be checked for what are sometimes small changes.

Based on our understanding of the data collection that HCFA has been doing in order to compute the Medicare Economic Index (MEI) update, the process involved in creation of the GPCI data base requires substantially greater effort. Even if everything were to go smoothly (i.e., all companies respond with complete and accurate data after the first contact), the number of companies involved would raise the effort involved above the MEI. Given this level of effort, the desirability of annual data collection must be questioned. It would obviously be needed if HCFA were to consider updating annually. However, going through this process annually when the data might not be used that frequently could be difficult to justify.

The main arguments in favor of annual data collection are that it would provide a stronger basis for computation of the MEI update and would allow HCFA to monitor changes in the geographic variation in malpractice costs and make updates at any time. At least since

1989 (when this new data series started), however, there is no evidence to suggest that the MEI update is seriously distorted. Admittedly, this has been a period of stable or falling premiums and it is impossible to know how this would look in the future. The ability to monitor changes in geographic variation could be important if HCFA were committed to making revisions when differences exceeded some threshold.

In the case of the malpractice GPCI, HCFA has the opportunity to annually update the index and ensure that it is always based on the most current available data. If that is viewed as a primary objective, then annual data collection and updating should be undertaken. On the other hand, if the malpractice GPCI is going to be treated as part of the same three-year review cycle required for all components of the GAF, then data could be collected only once every three years. It may be reasonable for HCFA to collect and review malpractice premium data every three years for extraordinary changes, then consider updating the malpractice GPCI every five years, on the same cycle as the office rental index. Thus, there would be a major "benchmark" revision of the entire GPCI every ten years, including Decennial Census data on earnings and rents, with one possible intra-censual update of the office rental index and the malpractice GPCI.

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